European carcass classification system does not predict eating quality *

S BONNY [1,†], G E GARDNER [1], D W PETHICK [1], I LEGRAND [2], J WIERZBICKI [3],
R J POLKINGHORNE [4] & J F HOCQUETTE [5]

[1] School of Veterinary and Life Sciences, Murdoch University, Murdoch, WA 6150, Australia.

[2] Institut de l'Elevage, Service Qualite´ des Viandes, MRAL, 87060 Limoges Cedex 2, France.

[3] Teagasac Food and Research Centre, Ashtown, Dublin 15, Ireland.

[4] 431 Timor Road, Murrurundi, NSW 2338, Australia.

[5] INRA-VetAgro Sup, UMRH 1213 Theix, 63122 Saint Genes Champanelle, France.

[†] Corresponding author ✉ S.Bonny@murdoch.edu.au

Global beef consumption is declining, and this is also reflected in the European markets. Variable eating quality is seen as a major factor in the decline in beef consumption and delivering a product of consistent and reliable quality is vital for the industry to maintain its profitability and market share. The European beef grading systems of EUROP Conformation score and Fat cover are used to determine the value of beef carcasses in Europe. EUROP Conformation score is determined by eye muscle area, carcass weight and a visual conformation assesment, and as such increasing EUROP Conformation score correlates with increasing lean meat yield. Previous work has highlighted that with increasing lean meat yield, there is a concurrent decrease of intramuscular fat. Decreasing intramuscular fat has a strong, negative, impact on trained taste panel scores for tenderness, juiciness and flavour. Therefore we hypothesise that increasing EUROP score will correlate with decreasing eating quality.

Seven cuts (striploin, outside, rump, tenderloin, oyster blade, knuckle and topside) from 100 French and Polish cattle were grilled to a medium doneness of 60°C. In total 1200 untrained French and Polish consumers rated the steaks between 0 and 100 for tenderness, flavour, juiciness and overall liking, according to Meat Standard Australia protocols. These scores were then combined on a weighted basis (0.3, 0.3, 0.1, 0.3 respectively) to make a fifth term called the Meat Quality score (MQ4). At slaughter, following standard European grading practices, all cattle were graded using EUROP conformation scores ranging from the most muscular, 'E' to the least muscular 'P'. Each of the 5 classes, 'E,' 'U,' 'R,' 'O' and 'P' were further subdivided into high, middle and low, giving a total of 15 EUROP conformation scores. The results were analysed using a mixed linear model with the MQ4 score as the dependant variable, cut, age and EUROP score fitted as fixed effects, and animal identification and the person responsible for conferring the EUROP grade fitted as random terms.

There was an effect of EUROP conformation score on MQ4, but only within oysterblade, rump and knuckle.

However in general the differences between these scores followed no clear linear trend across the EUROP conformation score categories. These results were not affected by correcting the model for carcass weight or USA Ossification score. Similiary when EUROP Fat cover was added to the model there was still no clear relationship between EUROP conformation score and MQ4.

Contrary to our hypothesis EUROP Conformation has no consistant, linear, relationship with the eating quality of beef. The absence of a clear linear trend across EUROP conformation scores limits the ability for production recommendations to be made to industry. Thus, while the EUROP system may adequately describe carcass muscling characteristics, it does not predict eating quality. The industry should consider using a system more related to eating quality to determine the monetary value of carcasses destined to be consumed as fresh beef, rewarding those producers supplying the meat most preferred by consumers.